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Historical development and functional renewal
of Budapest's waterfronts

MAIN FINDINGS OF THE PHD DISSERTATION

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Relevance and aims of the research

The waterfront is the interface between the city and the surface of a waterbody. In a narrower sense, it refers to the areas that remain after the transformation or disappearance of industrial, transport and logistic activities on the water's edge. Researchers that are interested in the topic deal with the utilization and redevelopment practices of these zones, as well as their social and economic impacts. However, are urban waterfronts more than a sub-type of brownfields, situated on a specific location?

Several authors have identified waterfronts as key sites of the transition from industrial to post-industrial city. Due to deindustrialization, these neighborhoods are transformed from the sites of production to the sites of consumption, which makes the waterfront a typical location of production of postmodern urban space. The rehabilitation of these areas not only brings new landuse types to the city but also opens up previously unavailable industrial areas. As a result, it improves the image of the city, and even enhances its competitiveness. Therefore, it may become a driving force for wider urban development strategies as well.

The aim of my dissertation is to overview the historical and current uses of the riverbanks of Danube in Budapest's transitional (i.e. industrial) zones. As a theoretical base, I review the rich international human geographical literature of waterfront regeneration, which is still quite rarely cited in Hungarian geography. Thus, in Hungary, my thesis is pioneering in summarizing the processes and development activities related to waterfront renewal. My purpose is to increase the diversity of urban geographical research. Although the topic of my research is not trivial due to the location of Budapest and Hungary, in my dissertation I point out its relevance.

I hope that my results will find a receptive environment among Hungarian geographers and other social scientists. The studied areas have already attracted the interest of several researchers who dealt with the brownfields of Budapest in the early and mid-2000s. However, those studies considered the riverside areas as background zones of regeneration axes. Researches from the 2010s have already revealed that waterfront development is perceptible in Budapest as well. At the same time, however, they have not gone deep into the topic. My thesis contributes to the above-mentioned literature in two ways. On the one hand, it explicitly approaches the investigated zones from the point of view of waterfront renewal, and on the other hand, it gives an integrated view of the whole length of Budapest's ex-industrial riverbanks.

My research results can be useful not only for geographers but also for urban developers. The relevance of dealing with waterfront renewal in the Hungarian capital is shown by the fact that various recent development plans of Budapest pay particular attention to the Danube. ‘Danube zone’ is mentioned as an important independent unit in the urban structure, and one of the development goals is creating ‘a city living together with the Danube’. One of the aims of my research is to make my findings useful for practical urban development, too.

Research questions:

- *To what extent waterfront renewal in Budapest is similar to the process described in the international geographical literature? Does it have any common characteristics with other post-socialist cities?*
- *Are the spatial dynamics of waterfront regeneration similar to those of the brownfields in other parts of the city? Can we find differences between the northern and southern zones?*
- *Is waterfront renewal delayed compared to the functional transformation along nearby traffic axes? Is waterfront renewal spatially balanced?*
- *What are the potential locations for sustainable waterfront renewal that fit into historical and social contexts? Where are the organic links between the city and the water’s surface? Does Budapest have ‘bluefields’?*

Structure of the dissertation

- In the first larger section of my dissertation, I explore the characteristics of waterfront renewal. This part is based on a wide range of literature from early studies of the 1980s to contemporary research in English and French language. I describe the initial situation in details by explaining the decline of large ports in the second half of the 20th century. Then I present the emergence and spread of the so-called ‘waterfront phenomenon’. This interpretation is primarily based on waterfront’s diffusion model by Hoyle, B. (2000) and the renewal cycles by Shaw, B. (2001).

The following chapter deals with how the topic was introduced into geographical literature. I present research networks, approaches, later on different models developed to describe the process in general or in details. I overview the

different types of relationship between the city and the surface of the water, such as functional linkages, visual contacts and other new forms of interconnection. I pay particular attention to the notion of 'bluefield' (Pinch, P. - Munt, I. 2002), which can be a key concept to achieve sustainable waterfront renewal.

Although it is clear that waterfront regeneration was originally connected to larger seaport cities, recently it has been interpreted in a broader sense, so post-socialist cities could also become part of the process. When examining the banks of the Danube in Budapest, the post-socialist context should obviously be taken into consideration. Therefore, I have collected the common characteristics of riverfront renewal taking place on the riverbanks of Central and Eastern European cities. This part of the dissertation can also be regarded as novelty, as it adds a new approach to Hungarian geographical literature dealing with post-socialist cities, and provides an opportunity to compare the waterfront processes of Budapest (and possibly other riverside cities) to its international counterparts.

- In the second part of my dissertation, I place the development of Budapest's riversides in a historical context. I put emphasis on the exploration of past forms of industrial landuse along the Danube. I also address a subchapter to urban functional changes on the 'waterfront' in earlier periods, in order to point out that such aspirations were formed well before the beginning of post-socialist transition. The historical overview begins with a description of port construction works. It is followed by the history of the sectors directly linked to the river. Then I widen the scope with areas close to the waterfront but with less functional interconnectedness. This part is supplemented by further tables in the appendix, containing data about the industrial sites mentioned in the main text of the dissertation. The scientific value of this historical chapter lays in the data focused on the waterfront from various local historical and industrial historical sources. Exploring the past of the industrial areas is not only an add-on to the subject but also helps to understand current processes.

- The third section of the dissertation explores the waterfront renewal processes that have taken place since the beginning of the politico-economic transition. This part is primarily based on my own empirical research.

The link between the historical overview (i.e. the previous chapter) and the empirical research is the subchapter dealing with the failed project of the Budapest World Exhibition in the 1990s. The methodology of this part is closer to the previous chapters, as it is mainly based on literature review. However, the topic is already the first significant wave of waterfront regeneration in Budapest.

In my empirical research I explore and analyze the morphological and functional transformation of Budapest's waterfront. The investigated areas are the meeting points of the transitional (i.e. industrial) zones of the city and the Danube. These are the brownfield sites on the riverside in North Buda (Óbuda), North Pest (Angyalföld and Újpest) and South Buda (Lágymányos, Kelenföld, Albertfalva and Budafok), South Pest (Ferencváros), together with the Northern peak of Csepel Island. The studied areas were extended to the main transport axes running parallel to the coast, so that the waterfront renewal could be compared to the development of those well-explored lanes in the brownfield literature. My own maps inserted into the body of the dissertation – and also into the appendix – help to follow the analysis.

In addition to describing the past and the present, I also make assumptions for the future by means of redevelopment potential analysis. In this part I look for areas that are the best suited for further waterfront regeneration. The analysis is based on what I call 'brownfield factors', 'environmental factors', and 'accessibility factors'. The results are compared to the content of current urban development plans of Budapest related to the Danube.

Methods of empirical research

The analysis of aerial photographs is an appropriate way to investigate functional changes in urban structure. Residential and mixed urban functions are distinguishable from industrial and transport functions, and even information about the status of brownfields (forms of landuse, building density etc.) can be collected when using high-resolution images. Nevertheless, there are aspects that can not be recognized from the view 'from above', so I supplemented my work with several field investigations and photo documentation of the sites.

The GIS analysis is based on archival aerial photographs from the period of the change of the political regime, published by the Department of Geodesy, Remote Sensing and Land Offices under Lechner Non-profit Ltd. Additional aerial photographs from 2000 and Google Earth images from 2009 and 2018 were also used. When choosing the four dates, I took the main periods of Budapest's brownfield renewal into consideration. I distinguished the disorganized processes of the 1990s and the more systematic renewal of the 2000s. Additionally, the 2008–09 economic crisis is an important turning point as well.

The establishment of the database and the following analyses were carried out in ArcGIS software environment. Not only the current landuse (2018) but also the type of previous utilization (in 1989, 2000 and 2009) were added as attributes to the land units. On the one hand, I made thematic maps from the database showing typical landuses in the given years. On the other hand, by comparing information about different time periods, the investigation and mapping of the spatiality of functional changes became possible as well.

In addition to functional changes, I also explored the transformation of the built environment. In order to analyze morphological changes, I compared the actual building stock of the studied area with the 'restored' building stock of 1989–90. This 'restoration' was also based on archival aerial photographs. When making the maps about morphological transformation, I used the contours of the buildings. Based on this method, it is possible to find where the significantly rebuilt areas are, where the stagnating zones are, and where the interventions or rehabilitations were interrupted.

When carrying out the redevelopment potential analysis, three factors were taken into consideration. As 'brownfield factors' I used the density of officially protected industrial buildings and the vicinity of the inner city as positive aspects, and known or probable soil pollution as negative aspects. This approach is based on the ABC model by Ferber, U. et al. (2006). As 'environmental factors', I considered the proximity of high-quality urban green areas and the Danube. At the same time I regarded the complexity of the coastline as a favorable condition. Kondolf, M. and Pinto, P. (2017) pointed out that acceptable scale of the space is of great importance for the everyday use of the waterfront. Therefore, I assumed that the side branches or bays (i.e. the complex shores) are more attractive especially in the transitional zone. 'Accessibility factors' are based on the distance from public transport stops. This distance is measured on the street network. The main sources of data were the Construction Plan of Budapest Metropolitan Area and downloaded files from Open Street Map. The latter required significant subsequent revision.

Based on these three factors, normalized potential values were assigned to the cells of a 100*100 meter grid. Then various weighted averages were calculated. The maps showing the results outline which zones are favorable in several respects and which zones emerge on the basis of at least one aspect. The zones belonging to the latter category may be improved significantly by ameliorating the weaker factors.

Generally, it can be stated about the methodology of my empirical research that using GIS tools brings a less frequent approach to waterfront research, as qualitative methods are more common in this topic.

Summary of the research results

I consider the collection of common characteristics of waterfront renewal in post-socialist cities as a theoretical result of my dissertation. I have found that the use of this notion is relevant for Budapest.

My dissertation offers the following additions to the rich brownfield literature of Budapest which flourished until the slowdown in construction works and real estate markets due to the crisis of 2008–09. It gives the opportunity to compare present and past spatial characteristics, and helps to keep track of transformations up to date.

Among the main results of my research, the detailed landuse database based on the aerial photography analysis, as well as my thematic maps about the functional and morphological transformation can be mentioned. The interpretation of the spatial processes with the help of the thematic maps is a key part of my dissertation. They also significantly helped me to answer my research questions.

With the redevelopment potential analysis, my primary purpose was to look for suitable areas for sustainable, human-scale revitalization fitting into the latest generation of historically and socially contextualized, accessible and ecologically valuable waterfront renewal. I have found that Budapest has some recently underused potential sites, even in the narrower meaning of ‘waterfront sites’. These areas should gain more public attention and they should be reused in a way that is favorable to a wider range of citizens. I also stated that especially ‘environmental factors’ provide further valuable areas. These latter zones are still considered as ‘terra incognita’. Green (re-)development of these riverside sites could increase the liveability, the ecological stability and the climate-resistance of the city.

I see the potential for further development of my research in improving my model. Collecting archival data and running the model on it would help to check the reliability of the model, as we know the actual results of the already finished parts of waterfront renewal. The other way would be refining and enriching the recent input data. Valuable buildings may not only consist of already protected objects but it is also worth collecting the hidden industrial heritage that may be in worse condition (before they disappear). Besides soil pollution, other forms of environmental damages (illegal

landfills, rubble-covered areas) can also be included in the model. The quality of the road network may also be taken into account when examining accessibility by car. Furthermore, new groups of factors could also be created. Ownership and land prices would be particularly useful for scrutiny but their collection requires other forms of research, and the hard-to-collect data may soon lose its up-to-date status.

After further improvement and refinement, the redevelopment potential analysis would also be applicable in practical urban development.

Answers to the research questions

- *To what extent the waterfront renewal in Budapest is similar to the process described in the international geographical literature? Does it have any common characteristics with other post-socialist cities?*

In Budapest, the decline of riverside industrial sites was not caused by containerization and the post-industrial transformation of the 1960s and 1970s but by the decline of state socialism and the rapid economic crisis that followed the change of political regime. It had the same effect on non-waterfront industrial sites, too. While in many Western cities the harbour was the site of the most spectacular decline, the riversides of the transitional zones of Budapest were only a few of the many sites that were simultaneously declining. As a result, the waterfront was not in a 'privileged' position, it could not attract significant attention. Thus, Budapest might be regarded as different from its Western counterparts in this sense, but at the same time it is also very similar to many of the post-socialist capitals.

Until the mid-2000s, no financial background was available for waterfront revitalization, and no major intention was shown for it (except for the World Exposition site). However, due to the lack of land prices in the period of socialism, these former industrial areas were on very valuable sites. This fact has been noticed soon by the actors of real estate market, which gained back its importance during the transition to capitalism. Initial redevelopment investments have yielded the same as profit-oriented waterfront regeneration projects in Western cities. Office buildings, high-end residential complexes have been built or are still under construction. New spaces of animated consumption have appeared.

However, looking behind the features that are visible on aerial photographs or on site, typical post-socialist problems can also be revealed. Political skirmishes, suspicions of corruption, clientelism, overpricing, overdue completion and inadequate

forms that do not fit into the local context are common features. At least some of these have become known in connection with the construction of the National Theater, the ‘Whale Budapest’ commercial and cultural center, the Danube Arena or the revitalization of Lágymányosi Bay and Kopaszi Dam. However, since the socio-economic transition was not as radical as in other post-socialist countries, the examples of extremity on international level are not from Budapest. The overall perception of the initially disputed developments has been refined and they have now become generally accepted.

Similarly to other post-socialist and even post-colonial cities, Budapest is from time to time subject to the temptation of copying Western mega-projects. Plans for event-oriented investments (World Exposition, Olympic Games) have failed so far. Large scale projects of elite neighborhoods and business centers, designed by Western ‘starchitects’ have also been doomed. However, several new investments of the latter type have recently started. The ‘advantage’ of previous bankruptcies is that the city has so far managed to avoid some of the conflicts known from Western literature (i.e. the disruption of access to urban spaces and the appearance of inadequate ‘architectural landmarks’ in the cityscape).

- *Are the spatial dynamics of waterfront regeneration similar to those of the brownfields in other parts of the city? Can we find differences between the northern and southern zones?*

Since the change of the regime, brownfields have almost disappeared from the northern part of Budapest’s transitional zone but they are still significant in the southern part. Paradoxically, some of the last remaining ‘rusty spots’ in the northern zone are located exactly on the banks of the Danube, whereas we find the only area that can be considered as neighborhood-level waterfront regeneration in South Budapest (Millennium City Center and Lágymányosi Campus). However, the favorable perception of the southern parts falls into ruins behind the Southern Railway Bridge where more rundown brownfields are found.

In the longer term, the balance is restored: the northern counterparts of Millennium City Center and Lágymányosi Campus are the neighborhoods of Újlipótváros, Vízafogó and South Óbuda that have already been transformed during the last decades of socialism. In fact, ‘only’ the same large-scale restructuring happened on the above-mentioned southern sites that were cleansed for the never realized World Exposition. Massive brownfield areas, both on the northern and

southern riversides have experienced sporadic regeneration. Nevertheless, the number of realized projects is higher in the previous zones (i.e. Graphisoft Park, Marina Riverside and other nearby residential complexes) than in the latter ones (i.e. Kopaszi Dam, Buda Riverside).

- *Is waterfront renewal delayed compared to the functional transformation along nearby traffic axes? Is waterfront renewal spatially balanced?*

The literature on Budapest's brownfields describes spatial expansion of functional transformation connected to transport axes. The maps based on my own research show similar processes. However, the brownfields on the riverside have 'remained in the shadow' for a long time. While downtown functions expanded further along the axes, first in the north then in the south, 'gates' to the banks of the Danube were opened only in a very few places.

Waterfront investments of the early and mid-2000s that resulted in opening up the banks of Danube have recently catalyzed their surroundings (i.e. the expansion of Graphisoft Park, recent constructions of Marina Bay and Danubio Residences, or Buda Riverside project close to the successfully revitalized Kopaszi Dam). On the whole, however, the waterfront still shows a rather mosaic pattern. It is in clear contrast with the nearly completely or at least significantly transformed transport axes. There are still large areas that have semi-industrial functions (i.e. Kelenföld, Budafok, Csepel) or which are underutilized and in many cases completely vacant (i.e. Soroksár-Danube branch, Újpest Bay, Óbuda Shipyard, Hunyadi Barracks).

The waterfronts in better position are the ones that were not real industrial sites formerly but were the sites of transport, storage and other associated activities. At the same time, it can not be stated that all of these zones have been revitalized (for example, the site of the former wholesale market and the peak of Csepel Island are still unused).

- *What are the potential locations for sustainable waterfront renewal that fit into historical and social contexts? Where are the organic links between the city and the water's surface? Does Budapest have 'bluefields'?*

Based on my redevelopment potential analysis, it can be stated that the possible areas of waterfront renewal are primarily the southern edge of Óbuda Island, the neighboring riverside of Óbuda, the Újpest Bay area, along with the wider zone of the peak of Csepel Island together with the northern part of Kelenföld. Particular attention

should be paid to these areas in urban development. The other parts of the riverside, which – according to my model – have not proved to be potential development zones, can be transformed into corridors of the city’s green infrastructure. They should be used as spaces for active recreation, cycling and walking. It is also worth mentioning that the potential for renewal could be significantly increased in the case of certain areas that only slightly emerge in my model.

The first and still significant waterfront regeneration sites of Budapest belong to ‘waterfront in a broader sense’. In fact, similarly to the case of other post-socialist capitals, these are functional changes along the banks of a river. The shoreline from ‘Whale Budapest’ to Millennium City Center and Lágymányosi Campus fits into the international trends. However, they have only visual relationship with the water.

Among the already renewed waterfronts, only Kopaszi Dam can be considered as a site to connect the water and the city functionally. Marina Bay and the Yacht Harbor of Óbuda Shipyard have a similar role but only for the high-end of society. These three sites can also be called ‘bluefields’, as they are not only newly associated with water but have played this role traditionally as well, even if in different ways.

In the case of Budapest, it is important to note that the sites that can be considered as ‘waterfront in a narrower sense’ are still underused. Among these, the most important are the shipyards in Óbuda and Angyalföld and the local port of Ferencváros. They provide ideal opportunity for wider bluefield renewal. Recently, rather the possibility is given, nonetheless we still have to wait for realization.

Publications related to the dissertation¹

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¹ Complete list of publications: <https://m2.mtmt.hu/gui2/?type=authors&mode=browse&sel=10032248>